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The Pinetum at Wellesley.

THE collection of coniferous trees which Mr. Hunnewell has been forming during the last forty years on his estate at Wellesley, in Massachusetts, is unsurpassed in the number of species and varieties of these trees that it contains, and in the size and beauty of individual specimens. Much has been said and written in the last few months of the injury sustained by conifers in the eastern states during the past winter, which was an exceptionally severe one for these plants; and in order to throw some further light on the subject, we have asked Mr. Hunnewell to furnish us with the dimensions of several of the most important trees in his collection, that our readers may realize the variety of conifers which can be grown in the New England climate, when they are planted in soil suitable to their requirements, and are carefully cultivated.

The soil at Wellesley is admirably suited to conifers, the subsoil being a light porous drift gravel which insures perfect drainage. The surface soil is naturally light loam, but has been enriched and greatly strengthened by the liberal use of peat on which Mr. Hunnewell feeds his plants. They have all received the best cultivation and are generally growing in sheltered positions, so that they have received, on the whole, exceptionally good treatment.

The tallest tree in the collection is a Norway Spruce (Picea excelsa), planted as a small nursery plant in 1852; it is now seventy-eight feet high, with a trunk circumference, taken eighteen inches above the ground, of nine feet. A White Pine (Pinus Strobus), planted about the same time, is only fifty-six feet high, the trunk girting, at the same distance from the ground, nine feet six inches. Abies Cephalonica, planted about 1860, is forty-two feet eight inches high, with a trunk six feet in circumference, eighteen feet from the ground. Abies Nordmanniana, planted about the same time as the last, is forty-two feet in height, the trunk girting only four feet six inches. Abies concolor (the California form or Abies lasiocarpa of gardens), probably planted about 1870, is twenty-eight feet high, with a trunk four feet in circumference. Another plant of the same species, known as Abies Parsonsii, and also Californian, is twenty-eight feet high, with a trunk four feet five inches in circumference, while a third plant, also of California origin, and incorrectly called Abies grandis, is twenty-six feet six inches in height, with a trunk four feet seven inches in circumference, all Mr. Hunnewell's trunk measurements being eighteen inches above the ground.

Of the Colorado Picea pungens, there are a number of specimens raised from the seed collected by Dr. C. C. Parry, the discoverer of this fine tree in the autumn of 1862. The tallest is thirty-three feet six inches, with a trunk circumference of three feet. A beautiful blue specimen is thirty-one feet high, with a trunk circumference of three feet four inches. Pseudotsuga taxifolia, imported from England, and of California or Oregon origin, and planted about 1865, is thirty-six feet high, with a trunk four feet in circumference. This plant grows in an exceptionally sheltered and favorable position, which accounts for the fact of its hardiness, the extreme western form of the Douglas Spruce usually proving too tender to withstand the climate of New England. The largest specimen of the trees of this species raised by Mr. Hunnewell from Colorado seed, collected also in 1862 by Dr. Parry, is now twenty-five feet five inches in height, with a trunk three feet in circumference.

Among other notable specimens, planted about 1870 or subsequently, are plants of the Japanese Picea Ajanensis (Picea Alcoquiana of gardens), twenty-one feet in height, with a trunk three feet six inches in circumference; Picea polita, seventeen feet in height, with a trunk three feet in circumference; Abies brachyphylla, twenty-two feet in height, with a trunk four feet in circumference; Abies Veitchii, fifteen feet high, with a trunk two feet eight inches in circumference; Abies Cilicica, thirty-one feet in height, with a trunk four feet in circumference; Abies orientalis, thirty-three feet in height, with a trunk three feet six inches in circumference, and one of the handsomest and most satisfactory trees in the whole collection; Pinus Koraiensis, twenty-two feet six inches in height; Pinus Lambertiana, eighteen feet in height; Pseudolarix Kæmpheri, twenty-one feet in height, with a trunk three feet six inches in circumference; Retinospora obtusa, twenty-two feet in height; Retinospora pisifera aurea, nineteen feet in height; Retinospora filifera, fifteen feet six inches in height; the Japanese Larix leptolepis, certainly one of the finest specimens, if not the very finest in cultivation, fifty-four feet in height, with a trunk three feet in circumference.

Among smaller specimens, there are fine plants of Abies Apollinis, Tsuga Sieboldii, Taxus cuspidata, from Japan, the best member of the genus for eastern North America, where it is perfectly hardy and very beautiful; Sciadopitys, Thuyopsis dolobrata, now well established; Thuya Japonica (the Thuyopsis Standishii of gardens), a hardy tree of much promise; Picea Omorika, the newly discovered Spruce of south-eastern Europe; Abies pectinata, Abies Pinsapo, of doubtful hardiness; Abies firma, of Japan; Abies nobilis, Abies magnifica, and Abies amabilis, trees of the Cascade and Sierra Nevada Mountains, which will not thrive in New England unless planted in unexceptionally favorable localities and tended carefully. The collection contains, too, all the well-known forms of Retinospora, and many forms and varieties of Thuya, Taxus, Tsuga, etc. The Pinetum proper contains about four hundred specimens, although conifers have been planted outside it in nearly all parts of the estate.

THE Wellesley plantations have a wider interest than that which arises from their dendrological value. The opinion is general that the sole reward of one who plants

trees is a distant hope that some one will enjoy them in after years; that tree-planting is a constant sacrifice of the present for the remote future, and that the highest good a tree-planter can hope to attain is a discipline in the virtues of patience and faith. This view is based on the fundamental error that no tree gives pleasure until it attains its full development, which comes, perhaps, after a century of growth. It would be quite as true to say that parents never enjoy the society of their children until after they become of age. The fact is that the planter finds the keenest delight in the companionship of his trees when they most need his care and are constantly expanding into new beauty under his attention. To the genuine lover of trees the tiniest seedling makes an appeal as direct and personal—though not as strong, of course—as does a Pine or Oak which is crowned with the associations of a century. But even the impatient American, who wants his full-grown forest at once, need not mourn as one without hope. Mr. Hunnewell was approaching middle age when he planted his first trees, and yet they attained stately proportions long ago. They are still improving, and will give increasing pleasure to his successors, but to him they have brought their own reward from day to day and from year to year since the hour when the gardens of Wellesley were planned.

And what a reward it has been! A refreshment from the cares of business that has never for a moment palled or failed—a stimulus for the mind, a wholesome recreation for the body. Hundreds of visitors enjoy the beauties of Wellesley every year, but to none of them are these beauties as fresh as they remain to the man who has created them and has been for years familiar with their changing phases all the season through. In the stress of business-life active men need some diversion, and certainly it is prudent to choose one of which we are not likely to grow weary. Mr. Hunnewell can testify with regard to the one he selected, that he has enjoyed it with a zest and relish that have grown keener every year. Nature is ever young. All her processes are expansive and replete with promise. One whose chosen companions are growing things has found the spirit of perpetual youth, with all its enterprise, exhilaration and hope. There was no selfish thought in the design, nor has there ever been a selfish thought in the maintenance of the Wellesley Gardens. For forty years they have been a public means of instruction and delight, and they will continue to attract visitors as long as there is any appreciation of horticultural taste and skill. But, like all good work, this has not been without its appropriate influence upon the doer—an influence which has helped to give the planter of the Pines of Wellesley the generous enthusiasm, the sunny and hopeful temper, the refinement and simplicity of character which are most thoroughly appreciated by those who know him best.

An Old House in New Jersey.

A RECENT number of this journal (vol. v., p. 367) contained a picture of the house at Morristown well known as the headquarters of Washington during the Revolution. As a companion to this fine example of colonial architecture we give to-day (see page 391) one of the few surviving houses constructed in the earlier, or pioneer, period of New Jersey history. Lyons Farms is just without the suburbs of both Newark and Elizabeth, and although the air vibrates with the roar of two cities this hamlet has been left in an eddy as "improvements" of various kinds have swept by on either side, and it wears an aspect of old-fashioned respectability which is quite in contrast with the upstart suburban smartness which prevails all about it. There are few places in the United States where the old Meeker house would not look out of place, and, to tell the truth, it seems a trifle antiquated even in Lyons Farms. No one knows just when it was built, but its present possessor has evidence that a direct ancestor of his, as well as of the artist who made the drawing here reproduced, was born in it in 1677. It is noteworthy that its present owner and occupant, Mr. William Grumman, holds it by inheritance, as all its former proprietors have done. The property has never been transferred by deed, but has descended directly from parent to child for seven successive generations from the original Meeker, who held his patent from the Crown.

The roof of the old house has been renewed, but the cedar shingles on the outer walls have remained where they were fastened with curious hand-wrought nails more than two centuries ago to testify to the durability of this wood. They were rived from the trees which once stood on the Newark Meadows—a forest whose remnants are remembered by many men still living. Apparently they never have been painted, but they have not decayed. Weather-worn they are, however, until in many places they are almost scoured away by the action of wind and storm, and the texture of their soft gray fuzzy surface bears little resemblance to that of the original wood. The house is still in fair repair within, and the double doors still swing on the heavy strap-hinges on which they were first hung. Some of the rooms are wainscoted with plank of Tulip-poplar and the heavy beams are scarcely seven feet above the floor.

The surroundings of this relic are quite in keeping with it. The great stone beside the well-curb is hollowed out into an ample basin, in which the family, after the fashion of an elder day, were wont to cleanse their hands and faces in the morning, while the well-sweep, the ancient sun-dial and sundry other details complete a picture which more closely resembles a homestead of the seventeenth century than any other with which we are familiar.

By Bicycle to the Waverley Oaks.—II.

HERE we are with the Waverley Oaks close by. The stream is Beaver Brook, celebrated by Lowell in one of his noblest poems. And now, as when he wrote, "Warm noon brims full the valley's cup." Some people call it Clematis Brook, but the name by which Lowell knew it is preferable. The brook forms the boundary between the town of Belmont and the city of Waltham, and the Oaks are within the limits of the latter place. The Oaks themselves are not conspicuous from the road, but a striking landmark is formed by a gigantic ruined Elm, with a grandeur like that of a crumbling old castle in its decay. It thrusts up its great gray branches out of a dense thicket by the brookside.

Mr. Lorin L. Dame describes this tree in *Typical Elms and Other Trees of Massachusetts*. "At all seasons of the year great trees are good to look upon," he says. "Some are finest when enveloped in clouds of green; others when stripped, like athletes, their mighty arms bared for conflict with the elements. This tree is most impressive in autumn, when its leaves are turned to bright yellow, and the glints of sunlight play upon a trunk of singularly tender color—one of the most poetic grays of the New England landscape."

The place is a typical old New England pasture, with some of the most characteristically beautiful features of such a landscape. We enter on the Waltham side of the brook, leaving our bicycles by the roadside, and stroll along the meandering course of the striking glacial formation known as a "kame," which forms a remarkable geological feature of the locality. Along the base of the kame Beaver Brook flows on its way to the Charles. We soon come upon the Oaks, dispersed over the undulating fields in informal groups, and with the park-like effect that an open sylvan landscape gives. I can do no better than quote Mr. Dame's description:

"The Waverley Oaks are scattered over an area of several acres upon the pasture-land sloping to the brook. Some of them drink of its waters, while others grow upon the sides of the long kame, its most appropriate adornment, 'their deep roots piercing the gravel deposits to the alluvium beneath.' While solitary Oaks as large as these are not uncommon, it is not likely there is another group of such noble trees within the eastern states. With one exception, they are White Oaks, now twenty-five in number. Strength, endurance, fixedness are theirs—sylvan virtues conspicuous even more in winter, when the snow lights up the scarred trunks and the great limbs stand naked against the sky. The sturdy individualism characteristic of the Oak pushes now and then to the verge of eccentricity. Each differs from its fellows; each is worthy the

pencil of the artist; as a whole they admirably illustrate the variant types of the species.

"Southward of the kame the photographer finds a marvelous theme in a shallow pool beset with Asters and tall grasses. At the water's edge, an inverted Oak, the solitary Swamp White Oak (Q. bicolor) of the group, stretches downward to an inverted sky. Five feet from the ground it measures twelve feet six inches in circumference; its height is sixty-five feet. Although this Oak, as well as its neighbors, fruits freely, there are no middle-aged or young trees. Were their successors ready to take the place of the failing veterans a part of the fine impressiveness of the scene would be lost. . . .

"It has always been a source of wonder how these trees escaped the ship-builders of Medford, to whom the big Oaks in their vicinity, one after another, fell victims, at a time, too, when the Middlesex Canal was transporting ship-timber that had been floated down the Merrimac from the remote wilds of New Hampshire. It is thought that a dispute with regard to ownership, the details of which are not definitely known, had something to do with their preservation at this critical period.

"The age of these trees, some of them apparently in the full vigor of their maturity, others lightly touched by time, some falling into decrepitude, who shall tell? The trees from time to time prostrated by the wind have been found to be hollow. Agassiz, it is said, roughly estimated the age of one of these at a thousand years. If the rings are to be taken in evidence, a more conclusive judgment is attainable. Some forty-five years ago one of the smaller Oaks was cut down, probably to assert ownership, and the rings, which were counted by Mr. Lowell, numbered over 750. In the light of this revelation Agassiz's estimate comes quite within the range of probability. The largest, and presumably the oldest, of the group may well have sheltered Leif Ericsson beneath its branches, and must have been at its best when Columbus rediscovered America. It stands upon the northern slope of the kame, is about fifty feet high, and measures, five feet from the ground, eighteen feet seven and a half inches in circumference, enlarging to some twenty-eight feet over the swell of the roots. It throws out at broad angles huge irregular branches; one enormous limb, the strength of whose mortising is the architects' wonder, pushes northward more than fifty feet. It was once much longer, perhaps twenty feet, when the mighty trunk, working to its full capacity, sent the life-giving sap to the remotest twigs.

"A huge stump marks the site of a whilom neighbor of this Oak, a great Buttonwood, admired by our fathers. Its prostrate forks still lie along the stream. The old Elm, conspicuous from the highway, is now a picturesque ruin, while the Oak, which has already outlived three or four generations of Buttonwoods and Elms, has in it the promise of decades of life."

These Waverley Oaks have long had a place strong in the affections of the people here, and are a favorite resort for many lovers of nature. The poet Lowell, in particular, was strongly attached to them. The proposition to secure their preservation for public enjoyment dates something like twenty years back. Some of the painters connected with the Boston Art Club then urged their purchase by that institution as a sketching-ground for Boston artists, as Fontainebleau serves for Paris. Fontainebleau, however, is not comparable with the Waverley Oaks in any of the elements of landscape-beauty.

An effort was recently made to secure the place for the Trustees of Public Reservations. The reason assigned by Mr. Dame as probably the one why the Oaks escaped the axe of the Medford ship-builders—a dispute in regard to title—appears to be the true one, since the same reason, fortunate in the first instance, has, unfortunately, prevented their purchase, it having been found that a clear title could not be given to the property. The only hope now appears to lie in exercising the right of eminent domain, and therefore it is felt that in case the Metropolitan Park Commission report a scheme that meets with legislative approval the taking of the Waverley Oaks with certain adjacent features of the landscape should form one of the main elements thereof.

Both in natural features and situation the place is peculiarly well adapted for a public pleasure-ground. It possesses the attractions of remarkable and varied landscape-beauty, scientific interest, both geological and botanical, and the charm of personal association with the memory of a great and noble poet. The population in the neighborhood is increasing rapidly; it lies within the limits of the important factory city of Waltham; Boston and Cambridge are near by, and the two railways running past could, by the establishment of a station, take and leave passengers upon the grounds.

The grand old Oaks, whose frequent dead and naked limbs betray the neglect they are suffering, might, by treatment similar to that which has rejuvenated so many decrepit old trees at the Arnold Arboretum, be restored to perfect health and assured a vigorous life for centuries to come. The landscape-features of the region are ideal for the creation of a pleasure-ground of rare beauty. The surface contours are beautifully molded, from the meadow coursed by the meandering brook to the fine proportions of the kame, which somehow recalls the modeling of a great sculptor.

Beyond the road to Waltham, which passes above, there rises the stalwartly rounded slope of Helmet Hill, a clean-edged mantle of woodland flung across it beyond, and giving to the grassy portion the effect of a fair shoulder. It would be well to include a portion of this hill, at least, in the park for the sake of the view, which is beautiful and extensive, and, by all means, the land on the other side of Partelo Road, embracing the course of Beaver Brook, as far as, and including, the mill-pond and cascade. This should be done both for the sake of Lowell's memory and for the unsurpassed combination of sylvan and pastoral scenery that would thereby be obtained.

I had never before visited the cascade and did not know exactly where to find it, though aware that it could not be a great distance away. So we determined to follow the course of the brook. This proved no easy task, for the ravine is well wooded, and, besides being rough with granite boulders, moss-grown and slippery in the deep shade, it has a thick undergrowth of the Spice-bush—Snapwood they call it on Cape Cod, because of its very brittle twigs. I remember the copious draughts of "Snapwood-tea" which were given me as a child when I had the measles, for the shrub is deemed an excellent febrifuge, says Gray. As we passed through the thicket the warm, moist air was filled with a very agreeable aromatic odor from the bruised leaves and broken branches.

The musical splashing of falling waters rose above the plaint of the rippling brook as we pressed onward. Soon we found ourselves looking up at the cascade; not a mill-dam, as we expected, but a natural water-fall, the brook tumbling in sturdy, irregular bounds over the same granite ledge that has for ages broken it into a mass of lace-like foam. The mill of Lowell's poem has vanished, with the wheel that tossed "armfuls of diamond and of pearl," and we no longer behold this portion of the picture:

> Beneath a bony Buttonwood
> The mill's red door lets forth the din;
> The whitened miller, dust-imbued,
> Flits past the square of dark within.
>
> Swift slips Undine along the race
> Unheard, and then, with flashing bound,
> Floods the dull wheel with light and grace,
> And, laughing, hunts the loath drudge round.

The "busy, never-ceasing burr" has at last ceased for ever. "Sweet Beaver, child of forest still, heaps its small pitcher to the ear," but now it no more "gently waits the miller's will." Hardly a vestige of the mill is now left. For the rest, the place remains as when Lowell described it:

> Climbing the loose-piled wall that hems
> The road along the mill-pond's brink,
> From 'neath the arching Barberry-stems,
> My footstep scares the sly chewink.

The high dam itself, as one looks up to it from the cascade, appears a "loose-piled wall," and the comparison of the pretty little pond, placidly snuggling in the woodland, to "a small pitcher" is an apt one.

We found Mill Street running close by, and had we known this fact it would have saved us the toilsome scramble through the thicket. Those readers who wish to visit the place will do well to remember this, and leave the road just after passing a rather modern and prosperous-looking cottage on the left.

The cascade is one of the few in the neighborhood of Boston, and the facility with which it may be included in a glorious park, exceptionally rich in natural features of striking beauty, makes it particularly desirable that the opportunity should be seized. The two portions of the park separated by Partelo Road, including the Oaks and the cascade respectively, could be easily united by raising the road so as to span the brook by a graceful arch, through which a footway might be carried beside the stream and bordering it through the glen to the foot of the cascade.

Boston. *Sylvester Baxter.*

"Petty sinuosities and all sharp turns in the course of roads or walks are undesirable; and it should be possible to go from any point in a park to another distant point without excessive indirectness of course; certainly, without so doubling on a course as to produce an impression of a return to the starting-point."

Notes on the Flora of Smythe County, Virginia. III.

POPULAR tradition declares that the distance from Marion to White Top Summit is twenty-eight miles, and even the most hardened mountaineer calls it the very worst road in the state, and looks upon the ascent of the mountain as an achievement for a lifetime. Most of the residents of Marion took what they called "that 'ere company" for a party of full-fledged lunatics, when they learned that we meditated its ascent a second time, having already spent three nights upon the summit.

Our traveling outfit consisted of two wagons—one fairly strong, drawn by a team of good horses, the other bearing a perilous resemblance to the "deacon's one-hoss shay" toward the close of its magic century. The team, however, was good, though the driver was not a man of brilliant intellect. Neither of the men, born and bred in Marion, had ever been on the mountains, and both would infinitely have preferred to stay at home.

It was on a dull day during the last week in May that we started. The road was passably good till we began the ascent of Iron Mountain, which was crossed at an altitude of over three thousand feet in a driving hail-storm. Along the gap, among the Hemlocks, there was a small grove of White Pine and beautiful thickets of Rhododendron Catawbiense intermingled with Mountain Maples (Acer spicatum), Striped Maples (A. Pennsylvanicum) and great hedges of the luxuriant Purple-flowering Raspberry (Rubus odoratus).

The road on the descent of Iron Mountain winds for two or three miles along White Top-tree Creek; the many small brooks that feed it run through dense forests consisting for the most part of Hemlock. Some of the trees are magnificent specimens, three to four feet or even more in diameter, and tower above everything else in the gloomy ravine, where Rhododendron maximum made an impenetrable tangle, individual plants being over twenty-five feet in height and tree-like in character. Kalmia latifolia was there also in great abundance, quite respectable little trees, with the gnarled, picturesque aspect of old Apple-trees. At that season, however, the only conspicuous tree in flower was Magnolia Fraseri. Many of them must have exceeded the fifty feet given as their height in *Gray's Manual*, for in some instances they seemed to rival the giant Hemlocks themselves. These made a picture to be remembered long. All along the gorge the straight, slim Magnolias, their light green leaves glistening with the rain-drops from the sudden shower, stood out in such clear outline against their dark evergreen background that each graceful, perfect flower seemed conscious of its beauty. For several miles at each turn of the road we saw a series of lovely tree-groups, and though, of course, there were many other interesting and remarkable trees, Chestnuts, Maples, Oaks and Tulips, the remembrance is only of the Hemlocks and Magnolias.

At a fork of the road we missed the right turning, and in consequence had to endure six miles, instead of two, of the roughest of corduroy roads; our "one-hoss shay," unlike its famous prototype, breaking down on an average every two hours. We were unable to reach the mountain that night, and took refuge in a small wayside inn near Green Cove on the North Carolina border, some twelve miles by the road from the top.

Near the spring where our hostess kept her milk-pans and great stone jars of butter, we found an antique Kalmia that has survived many winters. It was about twenty-five feet tall, and at six inches from the ground measured seven feet and two inches; at one foot from the ground four feet and three inches in circumference. It was not yet in bloom, but its magnificent proportions compelled our admiration.

Among the plants not collected before, nearer Marion, was Phacelia fimbriata, with charming little white flowers, a smaller and more delicate species than P. Purshii. With it along a little mountain stream was the tiny spring beauty, Claytonia Caroliniana, in fruit. The woods were all second growth, and, with few exceptions, large trees were seldom seen. A thousand feet or so below the summit we passed through a belt of Spruce-trees growing in a deep black loam bog. Clintonia umbellata grew there in great beds and was at its best; C. borealis was just beginning to show its pretty green bells, and unusually large specimens of the yellow Adder's-tongue (Erythronium Americanum) were still blooming. Streptopus roseus, with its tiny rosy bells, was plentiful; the delicate white Thalictrum clavatum grew along every little rill and ditch, as did also a particularly large and handsome swamp form of Viola cucullata.

Of all the swamp flowers, however, the most conspicuous and luxuriant was Anemone trifolia. This charming little plant, so long confounded with A. nemorosa, has rather an interesting history, which has recently been published by Dr. Britton in one of the *Memoirs of the Torrey Club*. It was collected twenty-five years or more ago by Mr. Canby on the Salt Pond Mountain, and again by Mr. Curtiss on the Peaks of Otter. It had been considered a distinct species, but on comparing it with the European A. trifolia it was found to be identical, and republished as such. Two years ago we found it in great abundance in flower and fruit in the localities mentioned above, and all through the higher altitudes of the Smythe County mountains we found it this year in even greater quantities, and especially fine in the great swamp on White Top. The plant stands mostly six to eight inches high, and sometimes even higher, and has in every way larger and coarser leaves and larger flowers than the frail little Wood Anemone of the northern lowland woods.

The Spruces were neither very old nor very large trees, and their very ancient appearance was caused by the luxuriance of the moss and lichen crop with which their trunks and branches were covered. Above the Spruce-swamp, on the edge of the road, stood a venerable Birch, one of the remains of the older forest on the mountain—a great gnarled old trunk that measured at three feet from the ground within two inches of twenty-three feet in circumference. Some twenty feet or more from the ground the main trunk was separated into four great erect branches, each a large tree in itself.

Range after range of billowy forest-clad mountain-tops of ever-increasing height, with the Roan and Grandfather mountains for a somewhat hazy background against a cloudless mid-day sky, was the sight that greeted us as we came out of the woods on to the great open field at an altitude of over 5,600 feet. The mountain-slope was not precipitous, but the great semicircle of North Carolina mountains lay apparently just at our feet. The grassy, rocky field, many acres in extent, the grazing-ground of many cattle, spreads right and left of the little group of cabins, where we stayed that night. The actual summit is covered with a dense forest of Black Spruce (Picea nigra). The grass is strewn with Violets and little low Strawberry-blossoms, and above, near the trees, the dainty little Carolina Claytonia was blooming, while the fragrant Trailing Arbutus still lingered in the dense shade. Under the Spruces we walked nearly knee-deep in luxuriant mosses, and the Cryptogamic collection was very large and most interesting. On the topmost cliff Rhododendron Catawbiense hardly showed signs of color on its great buds, though along the valleys we had collected and seen it in bloom for a couple of weeks. From those rocks we saw three white-flowered shrubs and trees blooming in the valley below: Amelanchier Canadensis, the Service-berry of the natives, its fruit already tinged with red; the Wild Red Cherry (Prunus Pennsylvanica), a graceful little tree covered with slender-pedicelled, delicate white blossoms, and the crowning glory of the whole, the Hobble-bush (Viburnum lantanoides), its great Hydrangea-like creamy cymes shining among the dark evergreens "like a good deed in a naughty world."

Some of the moss-covered boulders were overgrown with clumps of the Fetid Currant (Ribes prostratum), a pretty shrub notwithstanding its rather forbidding name, which, however, is well merited.

Early the next day we started on the return trip by a shorter and somewhat better road. On the south-east side of the mountain the white Baneberry (Actæa alba), the Blue Cohosh (Caulophyllum thalictroides), with strange, inconspicuous little greenish and brownish flowers, and the Umbrella-leaf (Diphylleia cymosa) had for a distance complete possession of the woods. The Diphylleia is a tall, handsome plant, with large, coarse, roundish peltate leaves and small cymes of white flowers with bright golden-yellow stamens. Along the road two yellow Umbelliferous plants were abundant, the small Zizia Bebbii, and the larger, more showy Thaspium barbinode. At a somewhat lower altitude we found a thicket of Menziesia globularis, with what in the Manual is called Vaccinium corymbosum, var. pallidum. The Blueberry is a slender shrub, with flat, spreading, very light green leaved branches and very full clusters of greenish white bells. The Pipe-vine (Aristolochia Sipho) grew high over shrubs and up on trees, and was covered with its strange little brown flowers.

During the latter part of the descent we were caught in another storm, and reached Marion at nightfall in a drenched condition. The luxuriance and almost abnormal growth of the mountain vegetation are not to be wondered at when the rainfall is taken into consideration. The day without a thunder-storm or sudden, short shower was a rarity, and a three days'

drought happened only once during our six weeks' sojourn in the county.

New York. *Anna Murray Vail.*

New or Little-known Plants.

Pterostyrax hispidum.

THE genus Pterostyrax, which is now composed of three or four ligneous species of China and Japan, is closely related to our American Halesias or Snowdrop-trees; indeed, Bentham and Hooker, in the *Genera Plantarum*, united the two genera, but we follow Professor Gray in believing that "the terminal paniculate inflorescence, quinary flowers, and thinner, smaller fruit" is sufficient to keep the two genera apart.

Fig. 65.—Pterostyrax hispidum.

The character of the inflorescence of Pterostyrax is shown in the accompanying illustration on this page, made from a photograph of a branch of Pterostyrax hispidum which flowered profusely last year in the Arnold Arboretum, where it was introduced several years ago from France, and where in a sheltered situation it has grown into a small tree now ten or twelve feet in height.

Pterostyrax hispidum is quite generally distributed in the northern parts of Japan and in central China where, according to Dr. Henry's notes, it becomes a tree fifty feet in height. The flowers, which are pure white and individually small, are produced in this country from the middle to the end of June.

Foreign Correspondence.

London Letter.

AT the meeting of the Royal Horticultural Society held on Tuesday last (July 26th), there were an unusual number of interesting and new plants exhibited. The bi-monthly meetings of this society have now become the generally recognized "parade-ground" for new and rare plants of all kinds, nurserymen as well as amateurs sending all their new introductions and new productions to be submitted to the various committees. This is as it should be. We now feel certain that every new plant of any promise in England is likely to be sent to these meetings to be judged by the committees and reported upon in the various horticultural papers.

ORCHIDS.—There were some plants of very exceptional interest among the several collections exhibited, the best being from Messrs. Hugh Low & Co., of the Clapton nurseries. Cattleya Schilleriana, var. Lowiana, is like the type in every respect except the color of the labellum, which is almost wholly of a clear lilac-blue, like that of Zygopetalum Mackayi. As a Cattleya, it is a plant of more than ordinary interest. Sobralia Lowii is a variety of S. macrantha nana, with flowers of a rich rosy crimson color. Mr. Norman Cookson exhibited three handsome hybrid Cypripediums, namely, C. Bryan, raised from C. lævigatum and C. argus, and resembling C. Morganiæ, except that the petals are shorter and the spots upon them larger; C. Youngianum superbum, raised from C. Veitchii and C. lævigatum, is another hybrid similar in appearance to C. Morganiæ, and is really handsome in the form and color of its flowers; the third one is C. Tautzianum, the parents of which were C. barbatum and C. niveum. It has a large well-formed flower, with broad flat segments, the color pale rosy purple, darker on the labellum.

A spike of Stauropsis lissochiloides (Vanda Batemannii), from the gardens of F. Wigan, Esq., of East Sheen, was much admired for its rich colors; it measured two and a half feet in length and bore ten open flowers with as many buds, each flower being two inches across, very fleshy and colored with rich purplish rose on the back, bright citron-yellow in front with brown-red spots, the lip being crimson. Although

not an uncommon Orchid in collections, this plant is only rarely flowered in England. Dendrobium Leanum, from the same collection, may be called a variety of D. Phalænopsis, with narrower segments than the latter. Eria vestita is a rare and handsome Orchid, of which there was a fine example, a yard high, with three stems clothed with leaves from the base upward and bearing five racemes of flowers. The whole plant is clothed with conspicuous reddish hairs, and the flowers are colored flame-red.

Cattleya Rex was shown in flower by two amateurs, and both plants were good. There can be no doubt now of the distinctness of this Cattleya from all others. It has the pseudo-bulbs and leaves of C. Gigas and a scape six inches long bearing four flowers, the sepals of which are three-fourths of an inch wide, the petals an inch in width, and the lip about the size of that of C. Percivalliana, very wavy and crisped; the colors are rich red-brown in the throat, crimson in front, with numerous reticulating lines of gold. The flower is more like that of the rare C. iricolor than any other known to me. The Messrs Linden are to be congratulated on having introduced such a distinct and handsome flowered Cattleya.

Nemisia strumosa.—This is a beautiful-flowered Cape annual, which was shown in quantity by Messrs. Sutton & Sons, of Reading. It is a charming plant, less than a foot in height, with lanceolate leaves and terminal heads of flowers, each flower an inch in diameter, and colored almost every shade except blue. This plant was a centre of attraction to gardeners, and was generally voted a first-rate addition to annuals for the open border. Nemisia is a genus of about twenty species of South African plants, belonging to the Scrophulariaceæ, and allied to Antirrhinum; indeed, some of them were once included in that genus. Only two of them have previously been tried in gardens, but they are poor compared with this new-comer, which Messrs. Sutton & Sons have introduced direct from the Cape. It is very remarkable in the wide range of color in its flowers.

Crinum Sanderianum is a very handsome stove-plant, and apparently an easy one to cultivate. It was introduced by Messrs. F. Sander & Co. in 1884 from Sierra Leone, and described by Mr. Baker. It is a close ally of C. scabrum, a common plant in tropical Africa, and C. Kirkii, a fairly recent introduction from eastern Africa. These are all large-bulbed, with short necks, glossy deep green leaves and erect scapes from one to two feet high, bearing umbels of from four to six flowers. In C. Sanderianum the flowers are large, with a curved tube six inches long, and broad lanceolate-connivent white segments, colored deep red along the midrib or keel. A plant of this Crinum has lately been an attraction in the stove at Kew. C. Americanum, a handsome species from the southern United States, is also in flower. It is a first-rate plant for beds in large stoves; at any rate it has stood in a bed in the Palm-house at Kew for the last ten years, and has flowered annually. It has an erect scape two feet high, bearing an umbel of four white flowers with narrow spreading segments and very fragrant. C. Moorei is at its best in the conservatory, and C. capense is in full flower in the borders outside.

Hæmanthus Katherinæ is a very handsome stove bulbous plant, and as easy to cultivate as the Eucharis. It is scarcely known in gardens, notwithstanding the enormous size and rich colors of its flower-heads, and the fact that it was introduced from Natal in 1877 and is easily propagated by means of offsets and seeds. Growers of bulbs for the European and American markets might do worse than plant largely of this Hæmanthus, the finest by far of all the species known.

Gloxinias.—Messrs. Sutton & Sons are the possessors of an extra-large flowered and otherwise attractive strain of these plants. They exhibited two named kinds at the last meeting of the Royal Horticultural Society which were favorably noticed, their names being: Her Majesty, with erect, very large, pure white flowers, the finest white yet seen; Duke of York, also erect, very large and white outside, deep crimson inside, with a broad, well-defined margin of pure white. They also sent some prettily reticulated varieties.

Mr. Eckford's Sweet Peas were a charming exhibit. I noted four of the best, which are: Emily Eckford, rich violet; Blanche Burpee, pure white; Peach-blossom, rich blush-rose, and Ovid, rosy crimson. Another noteworthy one was named Stanley, the flowers of which were deep vinous purple, almost too dark in fact. I believe these named Sweet Peas come true to color from seed. Mr. Eckford supplies them in sealed packets at from a shilling to half-a-crown a packet. Mr. H. Cannell exhibited a collection of his large double-flowered Begonias, arranged in a novel manner, each flower being mounted with Adiantum and Asparagus, and forming a really pretty button-hole bouquet. A lecture by Mr. A. J. Manda, of the United States Nursery, Hextable, on insectivorous plants, was the means of bringing to the meeting several fine collections, comprising Nepenthes, Sarracenias, Droseras, etc. Mr. Manda himself staged a very creditable group of small specimens, and the Nepenthes from Messrs. Veitch & Sons were exceedingly good, the cream of them being N. Burkei and its variety excellens, N. Curtisii, and, of course, N. Mastersiana, which still retains premier position among cultivated Nepenthes.

Carnations.—A special exhibition of these was held at the Drill Hall last Tuesday, and was a great success, the flowers, generally, being above the average, while the plants were mostly good in foliage and flower. The best Carnation in the whole show was Dr. Hogg, exhibited by Mr. C. Turner, of Slough, and the best Picotee, Mr. Douglas's Favorite. Mr. Turner's first prize collection of plants in flower comprised the following: Romulus, Iona, Mrs. L. Jamieson, C. Henwood, King of Scarlets, Duchess of Sutherland, Ruby, Favorite, Mr. Clements, Victory and Mrs. Nicholay. Mr. Douglas also took first prize for twelve trusses of one kind of Carnation with Oriflamme, a seedling border Carnation with large full flowers of a rich carmine-red color, in my opinion the most meritorious garden-plant in the whole lot. Another beautiful border Carnation is Colin de Haselvillo, with rich scarlet full flowers on stout stalks. Our exhibitions of florists' flowers are often spoilt by old-fashioned fads. A Carnation is a beautiful flower, seen at its best when on the plant and supported only by the ordinary stake and bast-tie, but it is a miserable object seen at its worst, cut and laid out on a disk of white paper and deprived of half its petals, the remaining half being arranged regularly and flattened out. And yet the latter is the recognized way to set up a Carnation-flower to be judged and admired. These dressed and collared flowers are worthless to every one except the florist showman; they are not Carnation-flowers at all in fact, and a bunch of natural flowers direct from the plants is worth a bushel of such "faked" productions.

London. *W. Watson.*

Cultural Department.

Notes on Shrubs.

THERE are several species of midsummer-flowering Clematis, distinct from the large-blossomed Florida or Jackmanni types, which, although long known to cultivators, are not very often met with in American gardens. The large-flowered and very showy species are now well disseminated and the older varieties advertise themselves. It has not taken many years to make almost every amateur gardener in the land familiar with such a plant as C. Jackmanni.

Some smaller-flowered species and varieties with colored flowers are in a manner quite as interesting as their more showy congeners, and are well worth more general cultivation in our gardens. C. Viticella is probably better known than most of them, but it is quite uncommon here. Although a slender-looking vine, it grows freely and tall, and will thickly cover a pillar or trellis or low wall with light graceful foliage, and with flowers nearly two inches in diameter, which expand most abundantly from about the end of June until the end of July. The flowers are ordinarily of a reddish purple color,

the outside being paler. They are not appreciably fragrant. There are a number of forms with variations in the color of the flowers, some of them being quite pale, or the sepals may be dark on the outer ends, changing to almost white at the base, and there are one or two forms which have double flowers. There are not many kinds of Clematis with colored blossoms which bear flowers in greater profusion, and it is perfectly hardy in this climate without any protection.

A very pretty and interesting little sub-shrubby species is known to botanists as C. aromatica, although it is probably more generally known in nurseries and gardens under the name of C. cœrulea odorata. It is not a climber, the stems only attaining a height of four or five feet, but requires a slight support in order to keep in an erect position. The flowers are a couple of inches across, the four sepals of a rich dark purple color, even darker than the great flowers of C. Jackmanni, and they have a sweet delicate odor. The sepals are narrow, becoming much reflexed after full expansion of the flower. The stamens are white, long and freely spreading. The plant seems quite hardy here, flowers freely from the latter part of June until the end of July—there are still a few stray flowers (August 3d)—and it requires the same treatment as other sub-shrubby or herbaceous species like C. recta. It is curious that the native country of this Clematis is unknown.

Another desirable species of much the same habit, but of somewhat larger, stronger growth, and which blossoms during about the same season, is known to us as C. Eriostemon. It has deep blue-purple flowers about two and a half inches across, composed of four thick strongly nerved sepals, which spread into a broad bell-shape, not becoming quite horizontal. The blossoms have a slightly sweet fragrance and are produced in abundance singly on long stalks, and when in good condition the plant is quite showy and attractive. It is perfectly hardy without any special care or protection, and is well worth more general use than it now enjoys. Wherever it is cultivated it is probably better known under the garden name of C. Hendersoni, while C. Chandleri is also said to be another synonym. Some years ago the Arboretum received a very pretty form from Herr Max Leichtlin, labeled C. Eriostemon Spachiana. This bears pinkish purple or very pale magenta colored flowers, the color deepening toward the base of the sepals.

We have several hardy native American species, which are in best bloom during July, but which differ from the foregoing species in having flowers which do not expand their sepals widely, but are narrowly inversely bell-shaped or vase-shaped. Although natives of our own country they are extremely rare in our gardens, the large-flowering showy sorts receiving almost all attention. These American species, while not brilliantly showy like the others, are extremely interesting, and some of them bear very pretty flowers.

Clematis coccinea is one of the most curious as well as one of the most attractive of them all. A native of Texas and the south-west, there seems to be no question of its hardiness here if given a warm well-drained soil, but it does not show the vigor and tenacity of life of some other species. Its flowers are almost top-shaped, or inversely bell-shaped, with the tips of the sepals only spreading slightly and forming a very small mouth. The color of the outside, which is perfectly smooth, is a bright red or scarlet, the small exposed interior portion light yellowish. The sepals are so thick and fleshy that they suggest edibility, but they are spongy and almost tasteless. The stems of the plant ordinarily grow about five or six feet in height.

Clematis crispa grows somewhat larger, and its sepals expand and recurve much more than those of the last species. Its flowers are very markedly ribbed on the outside, and they are of a very pretty pale lilac or light purple color. Its sepals are much thinner than those of the other.

These two kinds are the most beautiful and best deserving of cultivation among these peculiar American species. Several others are interesting, though not generally so pretty or so much admired.

Clematis Viorna, the so-called Leather-flower, with reddish purple blossoms, is well worth cultivating with the others, while C. Pitcheri will prove one of the most vigorous plants of all. The flowers of this are usually large and of a dull purplish color, the inner side of the sepals being very dark. It is a free-blooming species, but not showily ornamental. It appears to vary considerably in the size and depth of color of the flowers on different plants. Lavallée, in his celebrated monograph, described as C. Sargentii a plant which appears to be only an extreme form of C. Pitcheri, having small flowers and unimportant modifications in the leaves.

Arnold Arboretum. *J. G. Jack.*

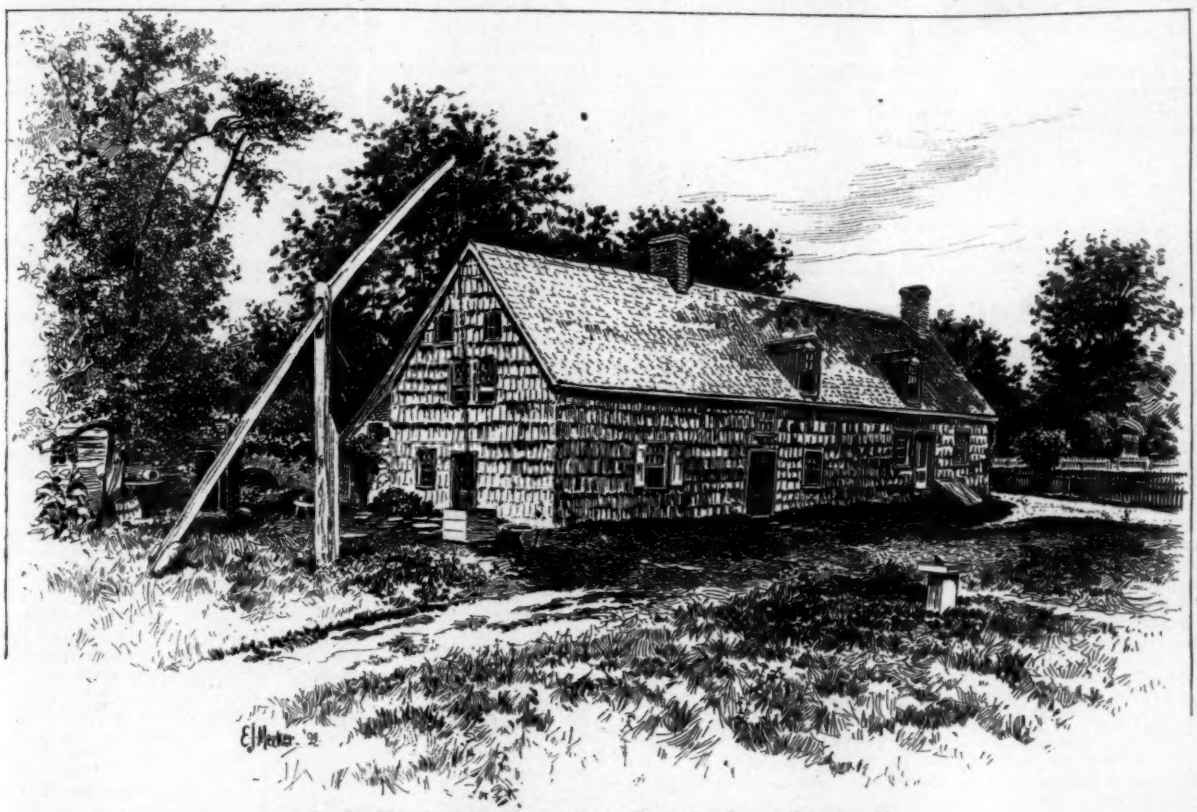

Fig. 66.—The Old Meeker House at Lyons Farms, New Jersey.—See page 386.

Cape Oxalis.—I.

THE greater part of the winter-blooming Oxalis now in cultivation are natives of the Cape of Good Hope, whence most of them were introduced a century ago, principally by Masson. In this article I wish to describe a group of species and varieties characterized by showy and generally large flowers and by glossy black bulbs, which are coated, inside the outer skin, with a sticky black matter and taper to a sharp point at each extremity, so that root-end and stem-end are indistinguishable from each other in a dormant bulb. How many of these forms are true species I am not botanist enough to decide, though it is very plain to those who have observed them under cultivation that some which are known by distinct names are but varieties of the same type.

Probably the best known of this group is Oxalis versicolor, which is a very beautiful little species with tufts of small leaves, each composed of three narrow leaflets, from among which rise the flowers on stems long enough to raise them well out of the foliage. These are about as large as a dime, pure white on the inner face (except the yellow of the throat, common to nearly all species of the genus) and striped with crimson on the outer edge of the back of each petal. When the flower is in bud this edging appears as a crimson spiral, and greatly enhances the attractiveness of the plant. In this description I have had in mind the best form of the species, for there are two other inferior varieties (given as species by Jacquin), Elongata and Tenuifolia. It is the last-named which is generally sold as Versicolor; its flowers are much smaller than those of the type, and their petals are narrow instead of broad; the leaves are smaller and of a darker color. I could get nothing but this from many different sources, and at last obtained the type, some eight years ago, from Van Houtte's nursery. I do not know where it can now be found. The variety Elongata is a trifle larger in flower than the type, but, as the crimson edging is absent or nearly so, it is less attractive. It is, of course, well known that many other species are marked with red exteriorly, but in Versicolor alone is this marking brilliant enough to be ornamental.

Oxalis variabilis, in all its forms, is one of the most pleasing species. Its leaflets are broad, of a deep green often of a bluish cast, and its flowers, when well grown, are an inch and a half in diameter. Jacquin gives the white form as the type, though his figure seems to represent the white variety of O. purpurea. The white Variabilis, which I am sorry to say I have lost, is perfectly pure in color and appears in profusion all through the winter. Variabilis rubra also blooms abundantly for many months; its color is very bright and fresh, very unlike that of Jacquin's plate. A difference between these varieties is that the leaflets of Rubra have very few, if any, fringing hairs, while Alba had, as I remember it, very many. I have two other varieties, Simsii and Longiscapa, red-flowered kinds of no particular interest.

Oxalis grandiflora was made a species distinct from Variabilis by Jacquin on account of the redness of the under side of the leaflets, which in O. variabilis is green, but I do not find this redness constant. Yet there are differences evident enough in the growing plants, for the flower-stalks of O. grandiflora are longer than in O. variabilis, and the flowers have less substance; there is a difference also in the color of the leaves.

Oxalis purpurea is a fine species with several good varieties. Its general aspect is much like that of O. variabilis, but it is of somewhat larger growth, its flowers being often over two inches across, especially in the type. Jacquin's figure gives the color as intense red-purple, approaching crimson-lake, but it is not so. A somewhat bluish purple is the true tint. Its variety Laxula differs from the type by its vivid crimson leaf and flower-stalks, which add much to its beauty. The variety Alba is the largest white-flowered kind, but its white is somewhat tinged with purple. This is a very handsome kind. Rosea and Lilacina are varieties whose distinctive color is expressed by their names. The species Laxula figured by Jacquin, a white-flowered kind which he thinks may be a variety of Purpurea, is unknown to me.

Oxalis breviscapa, which I had for a few years, and which I lost by that pest of small-bulb growers, mice, is a very interesting kind by reason of the shortness of the flower-stalks and the bright tan-colored under sides of the leaflets, two features which give the plant an unusual appearance. Rigidula is another very pretty white-flowered kind.

There are several other species belonging to this group of which I will say nothing because I have not yet been able to obtain them.

Like other Cape bulbs, all species of Oxalis can be carried safely through the winter in a cold frame; but the species named in this paper (except O. versicolor) are the hardiest of all, since they cannot only be planted out-of-doors in October, with a slight covering of leaves, with perfect security, as can several other species, but they will then bloom profusely in May, as other kinds will not do. It is best, however, to grow them as pot-plants, for we are apt to forget small things in the open ground, and a few days of great heat and dryness speedily destroy the little plants. Rather let them be potted, about six in a six-inch pot, at the end of summer, and be put in a sunny place indoors; then, with proper attention, such as house-plants usually have, they will be beautiful until spring. I hope hereafter to write of some of the other species with which I have had experience.

Canton, Mass. *W. E. Endicott.*

Notes on Stove-plants.

Medinilla magnifica.—This handsome species makes a valuable addition to any collection of stove-flowering plants in which large specimens are admissible, and, though not by any means a new plant, is still uncommon enough to attract much attention when exhibited. M. magnifica is a strong-growing plant of shrubby habit, with large ovate leaves, the latter being dark green and of somewhat leathery texture. The flowers are produced in pendulous racemes from the tips of well-ripened growth, and are rose-pink, the upper portion of the raceme being also more or less clothed with pink bracts, which add much to its showiness. To secure a good result from this plant it should be grown under similar conditions to those furnished to Ixoras—that is, plenty of heat and moisture during the growing season, and a somewhat less amount in winter, the flowers usually appearing in spring or early summer. Propagation by cuttings is not difficult, providing the wood used for the purpose is not too hard, single-eye cuttings being a good method to use in the operation.

Rudgea macrophylla.—This is another strong-growing stove-plant, and also long in cultivation, but seems even more uncommon than the Medinilla, to which it is a good companion plant to the above, thriving under the same treatment. It is also an erect-growing shrub, and has large oblong-ovate leaves on which the veins are quite prominent; the flowers are cream-colored and are produced in dense erect panicles from the tips of the shoots. Rudgea is also propagated by means of cuttings, which root in a reasonable time if placed in a warm propagating-frame. The best soil for either of the above plants is a light loam, well drained, and enriched with some old manure, but if the only available loam is of a clayey character it is best to mix some peat and sand with it in order to make a more open soil.

Pavetta Borbonica.—This is another unusual plant in the average collection, though well deserving to be more widely known, and is said to be related to the Ixoras, though grown for its handsome foliage rather than its flowers. The leaves of P. Borbonica are opposite, from six to ten inches long and two to four broad, their ground color being olive-green, on which the yellowish white spots appear to advantage, while the midrib is reddish. The leaves of this plant are glossy and very attractive, especially when it is grown in a single-stemmed plant to a height of two feet or more, and well furnished with foliage. A high temperature is best for Pavetta, with abundant moisture, and, in order to secure the best coloring of the foliage, abundant light should be given. A mixture consisting of two-thirds loam to one-third peat and some sand makes a satisfactory compost, and the pots should be well drained. It is propagated by cuttings, which should be placed in light peaty soil in a rather close propagating-frame, but even under the most favorable circumstances these cuttings will take a considerable time to root, perhaps from two to three months.

Holmesburg, Pa. *W. H. Taplin.*

Euphorbia pulcherrima.

UNDER its garden name of Poinsettia pulcherrima, this very showy winter-flowering plant has long been known and valued by many growers, but it must be admitted that so striking a subject deserves even wider distribution. Since the introduction of various forms of this species the time of flowering has been much extended, so that with proper management the blossoming-season can be prolonged from November to April, thus giving a supply of these brilliantly colored bracts during the whole of the dullest season of the year. As already intimated, it is in the bracts surrounding the true flowers of Euphorbia pulcherrima that the special beauty of this plant is found, and in well-grown specimens the head of such bracts attains a diameter of twenty to twenty-four inches,

and becomes a truly dazzling mass of scarlet. In order to secure such results generous treatment is necessary, and should be begun early in the summer. Care should be taken that the plants do not become dry, and they should be shifted on as the roots require it. The soil should be a rich light loam, in which a liberal allowance of dry cow-manure should be mixed, and after repotting the plants should be carefully watered for a week or two until the roots take hold of the new soil.

During the summer E. pulcherrima may be stood outdoors, this inducing a more stocky growth, but I think it advisable to place the plants in such a location that they can be covered with some sashes during rainy weather, for, when exposed to too much rain, they are apt to lose the lower foliage, and a long naked stem is no addition to their beauty. Some growers adopt the less troublesome plan of planting Euphorbias out in the open ground during the summer, but one great objection to this method is found in the fact that they do not lift well, the growth being soft and sappy, and, consequently, much foliage is lost in the operation if the weather should prove unfavorable. But, whatever method be adopted, it is not wise to allow these plants to remain outdoors after the nights become cool in the fall, for they are quite susceptible to cold, and a check of that character will result in smaller bracts.

After blooming, the old plants may be laid away under the benches in a warm house, and they will not require any water until it is time to start them into growth again in the spring, when they should be pruned back hard, and shaken out before repotting. Cuttings may be made of the old wood secured at the time of pruning, or from young shoots from three to six inches long, taken off with a heel of harder wood attached, the latter placed in a close propagating-frame and carefully protected from the sun, and they will with proper attention soon make roots. The young plants secured by the latter method will make a useful size for conservatory decoration during the following winter, providing they are potted on when necessary.

In addition to the type there is a double-bracted form of this plant known as E. pulcherrima plenissima, the whole centre of which is filled up with a crowded mass of smaller bracts of similar color to the original species. The form in question, one of the discoveries of the veteran collector, Mr. B. Roezel, created quite an excitement in the horticultural world at the time of its introduction, between fifteen and twenty years ago. The bracts of the double form are more lasting than those of the type, and, if water is not allowed to collect in the flower-heads, they may be kept in good condition on the plants for fully two months.

Another handsome variety is E. pulcherrima major (also known as E. rosea carminata), in which the bracts are of medium size and of a pleasing shade of carmine. There is also a variety with white bracts, but this is inclined to be weedy-looking, and is but little grown at the present time.

Philadelphia, Pa. *H.*

Coreopsis monstrosus, sent out recently by a Continental nurseryman, proves to be an improved form of what is usually known in gardens as C. lanceolata, but which is correctly C. grandiflora. The foliage is identical, and the variety is a very vigorous grower, a small specimen received early in the year forming now a large plant. The flowers are of a deep yellow, and somewhat larger than the type. The individual petals are very broad, from three-fourths to seven-eighths of an inch broad. As compared with other plants which represent the best hitherto attainable, the Monstrosus is distinctly an improvement. It seeds freely, but probably it will be necessary to propagate it by root-cuttings or side-shoots as usual.

Carnation Cyclops.—A few years ago a French nurseryman offered a strain of seed under the name of Dianthus plumarius hybridus, said to be a cross between D. plumarius and a Remontant Carnation. Plants from these proved to be very hardy, and were furnished with single flowers of an unattractive dull magenta. The strain offered as C. Cyclops seems to be a similar cross with a wider range of colors, some of which are pleasing, and it bids fair to be a useful plant for the garden. Double-flowering kinds were also offered, but these were not experimented with. The seeds of these germinated very strongly, in marked contrast with the Redondo Carnations offered by H. A. Dreer. These are said to have originated in California. The plants have very glaucous Carnation-like leaves, and there seems to be a great range of form and coloring among the flowers which are now showing. As they are very fragrant, come into flower the first season, and many of them are double and of good color, this strain seems to be worthy of further trial.

Elizabeth, N. J. *G.*

The Forest.

Forestry in Prussia.

In former numbers we have quoted extracts from a chapter on the "Woods of Minnesota," prepared by Mr. H. B. Ayres for the last volume of the Geological Survey of that state. Another portion of the same admirable paper includes some observations of Mr. Gifford Pinchot on Forestry in Prussia, which we reproduce below :

"All forest-management may be said to rest on two closely related facts which are so self-evident that they might almost be called axioms of forestry, but which, like other axioms, lead to conclusions of far-reaching application. These are, first, that trees require many years to reach merchantable size; and, secondly, that a forest-crop cannot be taken every year from the same land. From the last statement it follows that a definite far-seeing plan is necessary for the rational management of any forest, from the first; that forest-property is safest under the supervision of some imperishable guardian, or, in other words, of the state."

"Holding it as a duty to preserve the woodlands for the present share which they take in the economy of the nation, the state has recognized as well the obligation to hand down its forest-wealth unimpaired to future generations. It has recognized and respected equally the place which the forest holds in relation to agriculture and in the economy of nature, and hence feels itself doubly bound to protect its woodlands. In a word, it has been seen that in its direct and indirect influence the forest plays a most important part in the story of human progress, and that the advance of civilization only serves to make it more indispensable."

It has, therefore, steadily refused to deliver its forests to more or less speedy destruction by allowing them to pass into the hands of shorter-lived and less provident owners.

Even in the times of the greatest financial difficulty, when Prussia was overrun and nearly annihilated by the French, the idea of selling the state forests was never seriously entertained.

But the Government of Prussia has not stopped here. Protection standing alone is irrational and incomplete. The cases where a forest reaches its highest usefulness by simply existing are rare. The immense capital which the state woodlands represent is not permitted to lie idle, and the forest, as a timber producer, has taken its place among the permanent features of the land. The Government has done the only wise thing by managing its own forests through its own forest-officers.

"Donner, now Overland Förstmeister, in a work which carries all the weight of an official document, says:

"'The fundamental rules for the management of state forests are these: First, to keep rigidly within the bounds of conservative treatment; and secondly, to attain, consistently with such treatment, the greatest output of most useful products in the shortest time.'

"The state believes itself bound, in the administration of its forests, to keep in view the common good of the people, and that as well with respect to the lasting satisfaction of the demand for timber and other forest-produce, as to the numerous other purposes which the forest serves. It holds fast the duty to treat the Government wood-lands as a trust held for the nation as a whole, to the end that it may enjoy for the present the highest satisfaction of its needs for forest-produce and the protection which the forest gives, and for all future time, at least an equal share of equal blessings."

"The forest is a trust handed down from former times, whose value lies not only in its immediate production of wood, but also essentially in the benefit to agriculture of its immediate influence on climate, weather-protections in various ways, the conservation of the soil, etc. The forest has significance not only for the present nor for its owner alone; it has significance as well for the future and for the whole of the people."

"With respect to the second class of forest-property, that belonging to towns, villages and other public bodies, it is again impossible to speak for the whole of Germany except upon the broadest lines. The state everywhere exercises oversight and a degree of control over the management of these forests, but the sphere of its action varies within very wide limits. Even within the individual states it does not remain the same. Thus far, however, the action of the Government is alike, not only throughout Prussia, but in all parts of Germany. It prevents absolutely the treatment of any forest of this class under improvident or wasteful methods; nor does it allow any measure to be carried into effect which

may deprive posterity of the enjoyment which it has a right to expect."

"The relations of the state to the third class of forests, those belonging to private proprietors, are of a much less intimate nature. The basis of these relations is, however, the same. To quote again from Donner: 'The duty of the state to sustain and further the well-being of its citizens, regarded as an imperishable whole, implies for the Government the right and the duty to subject the management of all forests to its inspection and control.' This intervention is to be carried, however, 'only so far as may be necessary to obviate the dangers which an unrestrained utilization of the forest by its owners threatens to excite, and the rights of property are to be respected to the utmost consistency with such a result.' Prussia, of all the German countries, has respected these rights most highly, and the Government exerts practically no restraining influence except where the evident results of deforestation would be seriously dangerous. Here it may, and does, guard most zealously the woodlands, whose presence is a necessary safeguard against certain of the more destructive phenomena of nature, and which have been called in general 'protection forests.' Of their many-sided influence so much has been said and written of late in America—both truly and falsely—that no further reference to the subject seems needful.

"The state leaves open a way of escape for the private proprietor who finds himself unwilling to suffer such restriction of his rights for the public good, and shows itself willing to buy up areas not only of protection forests but also of less vitally important woodlands. On the other hand, it is ready, with a broadness of view which the zeal of forest-authorities sometimes unfortunately excludes, to give up to private ownership lands which, by reason of their soil and situation, will contribute better to the commonwealth under cultivation than as forest.

"In this way the forests, whose preservation is most important, are gradually passing into the hands of the state; yet the total area of the woodlands is increasing but slowly.

"The policy of state aid in the afforestation of waste lands important through their situation on high ground or otherwise is fully recognized (a notable example exists upon the Hohe Venn, near Aix-la-Chapelle), but the absence of considerable mountain-chains has given to this branch of Government influence very much less prominence than in the Alps of Austria, Switzerland and France, where its advantages appear on a larger and more striking scale.

"In closing this brief sketch of forest-policy in Prussia, you will perhaps allow me to refer for a moment to the erroneous ideas of German forest-management which have crept into our literature. They have done so, I believe, partly through a desire of the advocates of forestry to prove too much, and they injure the cause of forestry, because they tend to make forest-management ridiculous in the eyes of our citizens. The idea has risen that German methods are exaggeratedly artificial and complicated, and not unnaturally the inference has been made that forestry in itself is a thing for older and more densely populated countries, and that forest-management is inapplicable and incapable of adaptation to the conditions under which we live. It is true, on the contrary, that the treatment of German forests is distinguished above all things by an elastic adaptability to circumstances, which is totally at variance with the iron-clad formality which a superficial observation may believe it sees. It is equally true that its methods could not be transported unchanged into our forests without entailing discouragement and failure, just as our method of lumbering would be disastrous there; but the principles which underlie not only German, but all national forest-management, are true all the world over. It was in accordance with them that the forests of British India were taken in hand, and are now being successfully managed, but the methods into which the same principles have developed are as widely dissimilar as the countries in which they are being applied."

So forest-management in America must be worked out along lines which the conditions of our life will prescribe. It never can be a technical imitation of that of any other country, and a knowledge of forestry abroad will be useful and necessary rather as matter for comparison than as a guide to be blindly obeyed. It must be suited not only to the peculiarities of our national character, but also to the climate, soil and timber of each locality, to the facilities for transportation and relations of supply and demand, and the hundred other factors which go to make up the natural character of a hill-side, a county or a state. Its details cannot be laid down ex cathedra, but must spring from a thorough acquaintance with the theory of forestry, combined with exhaustive knowledge of local conditions. It will necessarily lose the formality and minuteness which it has acquired in countries of older and denser settlement, and will take on the character of largeness and efficiency which has placed the methods of American lumbermen, in their own sphere, far beyond all competitors.

Correspondence.

Hardy Plants in Flower at Short Hills, New Jersey.

To the Editor of Garden and Forest:

Sir,—I went over to the United States Nursery a few days since to see, more especially, what effect the long spell of dry and insufferably hot weather prevailing lately had had on the hardy plants. This is a rather severe test, since the plants are fully exposed on a hillside which is somewhat dry, but I failed to notice any injury visible. This is probably because the plants are well cultivated, with the soil kept loose, a condition of things not always possible in a small garden. Lilies at this season, perhaps, call for the first notice. There was a fine selection of Lilium auratum varieties, L. auratum macranthum (or platypetalum) being the gem of the collection. This variety is very distinct, having broader leaves than the type. In well-established plants the stems are an inch or more in diameter. The flowers are very large, twelve inches in diameter, with pure yellow bands and studded with yellow spots. L. auratum pictum has bands shading from red at the tips of the petals through yellow to green at the centre. L. auratum vittatum rubrum has a dull crimson band, in some cases very broad. L. auratum Wittei is a pure white variety, with a clear yellow band. The typical Auratum Lilies are such popular plants that these rarer varieties are well worth noting. Some double-flowered Tiger Lilies made a broad mass of color and individually were striking flowers. Delphinium Sinense was in broad masses in three colors, white, dark blue and light blue, the latter being especially pretty and showy. This is a rather low-growing variety some eighteen inches high at present.

Pardanthus Chinensis is a rare plant with reddish orange flowers spotted brown. It is iridaceous, with sword-like, stem-clasping leaves, and seems to be a distinct plant worth growing, though probably not reliably hardy further north. Midsummer, of course, brings many yellow Composites to perfection. Besides the ever-present Anthemis tinctoria I noted that Messrs. Pitcher & Manda grow Rudbeckia speciosa (Newmanii) in quantities. This is certainly a showy Cone-flower, very effective in masses. Another plant labeled R. subtomentosa was an interesting variety, with long, narrow petals and greenish yellow cones.

Heliopsis lævis is a native Sunflower, grown here largely, but it does not strike me as producing a desirable effect except for a wild plantation. Hardy Sunflowers are deservedly popular plants. Probably the best selection that can be made is H. decapetalus, H. decapetalus multiflorus, H. rigidus, H. lætiflorus, H. orgyalis and H. Maximilianii. The two latter have very distinct and attractive foliage at all seasons, the narrow drooping leaves proving peculiarly effective. To the above varieties might be added H. mollis for a bold group, a plant of very stiff erect habit with broad foliage and Inula-like flowers.

The photographer was busy over a new Sunflower of an undetermined species, which was a very striking plant about three feet high, entirely covered with deep yellow single flowers about two to two and a half inches in diameter, and individually very neat and distinct. The foliage was small, and though not abundant seemed hard and good.

Few flowers can vie in color with Lobelia cardinalis. A mass of Cardinal-flowers seemed as happy in this dry soil as in its native bogs. The hardy Blanket-flowers (Gaillardia grandiflora) are effective plants when well-grown, though they seem to decline to take the compact form of the catalogues. There are few hardy plants which have a longer season of flowering or are altogether more satisfactory. Achillea, The Pearl, has deservedly excited much attention lately, as it is a great improvement on the old Milfoil, Ptarmica, one of the weediest and most straggling of hardy flowers, though useful for its small white blossoms.

Elymus glaucus should interest every lover of grasses. It is very glaucous, and a good clump would excite attention in any garden. Another somewhat effective foliage-plant grown here is Eryngium amethystinum, one of the brightest of the Sea Hollies. I was glad to see a lot of Viola tricolor, the old-fashioned Heartease, or Johnny-jump-ups, of our grandmothers' gardens. Mr. Manda thinks he has a treasure in a new double purple Datura, which is certainly a vigorous

grower and bears a wonderful flower, quite as big as the Brugmansia.

In the houses I found a new Begonia species (tuberous), with the habit of Martiani, but with handsome spotted leaves and pinkish stems. Many varieties of Orchids were in flower, the most striking of which was a pure white form of Cattleya Gaskelliana. The great collection of Cypripediums here always gives me a sense of confusion, it is so impossible to comprehend the wonderful variety in the time at one's disposal. When Mr. Manda casually picks up a small pot graced with three or four leaves and remarks that it is the other half of a plant which he has sold for $675, one muses on his fifty-cent specimens of the same genus at home and concludes that only the Cypripedium fancier can do justice to the subject.

Elizabeth, N. J. *J. N. Gerard.*

Home-made Linen.

To the Editor of GARDEN AND FOREST:

Sir,—It is almost with a feeling of veneration that I now spread my home-spun table-cloths to serve for dinner. They are the last of a trunkful of linen brought over the Atlantic thirty years ago. Throughout this long period they have been in constant use, but now, unless supplemented by newer fabrics, their end is at hand. For more than fifty years the hands that so willingly spun and wove these threads for others' use have been resting in the grave—hence the sacredness which attaches to these relics of a former generation.

In the German household the love of linen is a passion. During the French wars under Napoleon when, from every town and hamlet, the terror-stricken people fled before the approaching armies, before all else they sought to save their many chests of home-spun linen, and when peace returned, what had escaped the Argus-eyed enemy was tenfold more precious, because of the horrors witnessed and the dreadful pangs endured. And even to-day the German woman prizes, far above rubies, her piles of snowy linen, the labor of many happy hours.

Here in this country the use and sale of imported linens assume yearly larger dimensions. The people are learning to realize its value and comfort as an article of wearing apparel. The southern product, the cheaper cotton, supplies the world's demand. Why may not the north add to its resources by reviving this old and important industry, and raise, at least, sufficient flax for home consumption? The women, too, would gain by its revival. Instead of spending time and strength upon the almost worthless trash called bric-à-brac, which cumbers rather than adorns their homes, they might again possess their stores of home-made linen, which far surpasses in value and durability the best product of the machine. We live only for a day. Why may we not go more slowly and evolve a truer prosperity with its resulting tranquillity?

In European countries, when at certain seasons the traveler turns his eyes over the landscape, he sees dotted here and there fields of blossoming blue which ripple in the summer sunshine like the waves of the sea. They are acres of blossoming flax, sowed and cared for with surprising interest by the members of the household to which it belongs.

During a lifetime of observation one sees many changes in the customs and sentiments of people and nations. As in Bible days, there is a time for everything. The coming World's Fair will offer a grand opportunity to show what feminine hands abroad are doing in the seclusion of the home, from the Hungarian peasant woman's world-famed embroideries of home-spun linen to the lace-like products of the hand and loom of working and gentle woman. The number and variety of fabrics produced from this little slender-stemmed plant, in itself so insignificant, are so enormous that it may be well worth while to consider its re-introduction into our own country.

Hartford, Conn. *Wilhelmina Seliger.*

Albinos among Orchids.

To the Editor of GARDEN AND FOREST:

Sir,—In your issues of March 23d and June 22d the occurrence of a white form of Habenaria psychodes is noted. Last July I collected not H. psychodes, but H. fimbriata, on an open hill-side bog near Tannersville, New York, where it grew in quantities, and with it a white form as beautiful, if not more so, than its rose-purple neighbors. The flowers were identical as far as I could see, though possibly very slightly smaller. This year, on July 23d, in crossing the same bog, I found the Habenaria in full bloom, the white-flowered form, as last year, neither quite as large nor quite as abundant as the purple ones. It is a very handsome species, growing here from one to two feet tall among the Reeds and Grasses, the spikes often ten inches long and nearly three inches thick.

Onteora, N. Y. *Anna Murray Vail.*

Local Plant Names in New Jersey.

To the Editor of GARDEN AND FOREST:

Sir,—As our boasted civilization progresses, and as railroads penetrate farther and farther into the wild and remote corners of our country, primitive conditions will be replaced by those more complicated, and differentiation and redifferentiation will follow closely this process of evolutionary growth. The forests will be destroyed for fuel and timber (to be renewed later at great expense), the streams of limpid water will be dammed for irrigation purposes, and the cleared and irrigated land will be cultivated. The customs of a simple and unsophisticated people will suffer by the same ruthless hand of progress.

I was very much impressed by this fact while traveling, some time since, through the sparsely settled portions of southern New Jersey. The farther I journeyed from the railroad and the deeper I penetrated into the lonely barrens and swamps, the more unsuspecting of strangers the people became, and the more hospitable. A man was harrowing a piece of sandy peat soil, near his one-storied cabin, with a triangular harrow, constructed of green limbs, into the framework of which, at irregular intervals, through auger-holes, were driven pointed sticks. An ox, attached to this primitive agricultural implement by means of a clothes-line spliced together and a bent stick as a yoke, was slowly breaking up the soil for a truck-patch; the poor beast was switching its tail in the vain endeavor to keep off the troublesome mosquitoes and the galling and persistent woodflies. This interesting picture of man, ox and harrow recalled the descriptions given of the early Aryan culture, when barley, wheat and flax were planted, and the ground was stirred by a crooked branch of a tree, tipped probably with the tine of a stag's antler, which served crudely as a plow.

Local names survive, as a general rule, in the process of speech evolution, and bear evidence of the cultural stage and inventive genius of a people in introducing new words for new phases of nature, and to describe new animals, plants and things. My purpose is to record in GARDEN AND FOREST a few of the local plant names current in parts of southern New Jersey. The fishermen along the Little Egg Harbor River call the Eel Grass (Zostera marina) Tiresome Weed, for, as they pull against the current in sailing to and from the ocean, the "grass wrack" entangles their oars and retards their movements. They also call the most beautiful of our spring Orchids, Cypripedium acaule, "Whip-poor-will Shoe," which is quite as poetical as Lady's-slipper.

The common Pitcher-plant, Sarracenia purpurea (Side-saddle-flower, Huntsman's-cup in *Gray's Manual*), is called locally in Cape May County "Dumb Watches." The beautiful purple flower grows from the centre of the rosette of pitchered leaves below, and after a time the purple incurved petals fall, exposing the summit of the broad, expanded, petal-like stigma. The five green sepals remain, and resemble, in the imagination of the peninsular New Jerseymen, a watch-case, and the convex surface of the expanded stigma is likened by them to the face of a watch. This vegetable time-piece, with no hands to point the hours of the day, without the constant tick, tick, tick, is dumb. The whole plant is denominated, very significantly and ingeniously, "Dumb Watch," or simply "Watch."

A person interested in folk-lore might find an interesting field for investigation and research among the simple, hospitable and intelligent inhabitants of the shore and inland towns of the Pine-barren regions of southern New Jersey.

Philadelphia, Pa. *J. W. Harshberger.*

Notes.

In vol. xvii. of the *Botanical Gazette* Mr. John M. Coulter recently published a sketch of the life and labors of the late Sereno Watson, with a portrait and a view of the interior of the herbarium of Harvard University.

The Rose, Gustave Piganeau, was sent out in 1889, but it takes some time for a new variety to be fully tested. This one is spoken of very highly by the English growers, and it has held a very prominent place at the exhibitions there this year. The flower is very large and yet it is good in form

and has a clear carmine-like color without any dingy suspicions of lilac or purple which mar so many Roses which are otherwise good.

The International Botanical Congress, to be held this autumn at Genoa, Italy, will open on the 4th of September and will close on the 11th, unless there seems good reason for prolonging it a little further.

Tomato-plants which have been growing over vigorously during the recent warm and moist weather may have failed to set much fruit. Where this is the case a sharp spade should be run down beside them to prune off the roots, and this will turn the vigor of the plant toward forming fruit.

The project of removing the Botanical Garden in Berlin to a new and more favorable locality has long been under discussion. Plans for carrying it into effect have now been decided upon, and Herr Perring, Royal Inspector of Gardens, has been commissioned to examine the other great botanical gardens of Europe in search of helpful information.

The manufacture of a new material called Bamboo-sheeting is said to be rapidly extending in the province of Wenchow, in China. The cane is split so as to form a sheet which is softened in boiling water and then pressed out flat. When dried, the sheets are ready for use and are employed for veneering as well as in making trays, fans, screens and open-work carved panels.

It takes many years, and often many generations, to develop a fruit or vegetable with the best edible qualities from its original wild state. It was the opinion of Dr. Gray that if modern civilization had begun in America our Ground Nut (Apios tuberosa) would have been the earliest developed esculent tuber, and would probably have held its place among the first, along with Potatoes and Sweet-potatoes.

An official reward for a new large-flowered Pelargonium, which is called Lisbeth Moncorps, and is the offspring of the varieties Mabel and Nympha, was recently bestowed in Germany upon Herr Moncorps. The plant is described as extremely sturdy and floriferous with flowers of a very pure color; and particular attention is called to the fact that, in ten months from the seed, Herr Moncorps had raised a specimen bearing about thirty strong flowering stems.

Late-blooming Tamarisks are just now very ornamental. Specimens that were cut back early in the spring are now waving their long and slender branches covered with fern-like foliage and pointed with great clusters of pink flowers. This is one of the shrubs which do very well where the sea winds prevail and even where the salt spray of the sea can reach them. But they do equally well farther inland, and are among the most beautiful trees which flower in late summer and early autumn.

We observe in some florists' windows a repetition of the practice which prevailed three or four years ago, of using the large white flower-heads of Hydrangea paniculata grandiflora on long stems, in large vases, with a few spikes of Gladiolus of some pronounced color. This makes an effective combination, as well as a very durable one, for the Gladiolus will continue to open its flowers in succession for a long time, and the Hydrangea-flowers will not only remain without wilting for a fortnight in a warm room, but will dry on the stem and preserve their creamy color throughout the winter.

Osbeck's variety of Rhus semialata is now ornamented with its large panicles of flowers, which are not a pure white, but which are nevertheless quite showy at this season, since they stand out well from the very dark green and clean foliage of the tree. None of the trees we have seen are more than twenty-five or thirty feet high, although, perhaps, they will attain considerably larger proportions in this climate. It is not as graceful as our native species, since the branches are not furnished with leaves except at the extremities, so that the tree has a rather bare and open look about the main branches.

In a pamphlet called *Chicago and the Columbian International Exhibition*, recently published in Berlin by the Imperial Commissioners for the Fair, German horticulturists are given all needful information and are heartily encouraged to make the best possible exhibition. We are glad also to find that *Gartenflora* calls attention to the fact, which we have already noted, that at a special meeting of the American Seedsmen's Association a cordial invitation was extended to European seedsmen, thus disposing of the unfortunate rumor that our dealers had threatened to boycott such foreigners as might venture to compete with them at Chicago.

Phœnix Park, in Dublin, is more than six miles in circuit. It contains something like 1,700 acres, and consists of wooded slopes and deep valleys, with lakes in the hollows, and broad expanses of Furze-covered land and an abundance of majestic old Oaks, Elms and Beeches. Fifteen hundred sheep and a thousand fallow deer, said to be the finest in Her Majesty's dominions, are grazed in the park. The People's Garden is the name given to an area of about sixteen acres in the park devoted to the cultivation of various kinds of flowers. This flower-garden is very convenient of access, being within four hundred yards of Sackville Street, the principal street in Dublin.

Mr. Andrew D. Hopkins, of the West Virginia Experiment Station, writes to *Science* that one of the bark beetles (Dendroctonus frontalis) is destroying many coniferous trees in that section. It has generally been held that these insects do not attack living and healthful trees; but investigation shows that vigorous individuals of five species of Pine and of the Black Spruce have been killed primarily by the attacks of this beetle, which preys upon the green bark. Trees from five inches in diameter up to the largest specimens of White Pine have been ruined by them. When attacked in the autumn the trees may remain green until spring, when other bark and timber beetles re-enforce the original invaders to the number of twenty-five species. Later on these scolytids are followed by insects belonging to other families, until, in a dead or dying tree, there may be hundreds of species and millions of examples breeding in and feeding on every part of the tree, from the base to the terminal twigs, rendering it worthless for lumber within a year after it dies.

It is a pleasure to call the attention of instructors in botany to Professor Byron D. Halsted's brief article, "Beginnings in Botany," published in the August number of the *Popular Science Monthly*. "Much has been said," writes Professor Halsted, "largely in a theoretical way, concerning the general question of university extension. Various experiments have been made, and by another year definite plans will be matured for the popular presentation of many of the subjects that come within the scope of the extension movement as now understood by those who have had the most to do with the scheme for the education of the masses. The writer has recently finished a brief course in botany, and as the method pursued differed in some features from any previously followed, there may be sufficient reason for presenting an outline of the ground covered and of the ways and means employed for bringing the subject to the attention of a popular audience." Of course, it is impossible here to condense Professor Halsted's account of his work, but we feel sure that it will give helpful hints to all other persons similarly engaged.

The Michigan Flora, prepared for the thirtieth annual report of the Secretary of the State Board of Agriculture by Professors W. J. Beal and C. F. Wheeler, is much more than a simple catalogue of the plants of the state of Michigan arranged in the order of their botanical sequence. The pamphlet opens with a brief account of the topography of the state, dividing it into ten regions, whose physical characteristics are described, and whose outlines are laid down on a map. Rather full lists of the plants which are characteristic of each of these regions are then given. Notes on climate and distribution are added, and then come some interesting chapters on the trees and shrubs of Michigan as compared with those of the rest of the world, with the reasons why the Michigan flora is so rich and why there are so few species in Great Britain, for example. Interesting lists of trees, selected for various qualities, are furnished, as, for example, the native trees and shrubs which should be selected for the color of their leaves in autumn; small trees which are distinguished for their flowers; shrubs and trees which are distinguished for beautiful fruit, and those which are distinguished for showy or brilliant colored bark. Then come lists of plants which twine or climb in different ways; evergreens that turn to a bronze color in winter; plants suitable for winter bouquets; bog and marsh plants which are promising for cultivation, and native Ferns which deserve to be cultivated; trees which indicate a fertile soil, and others which indicate a barren soil; trees valuable for timber and for firewood; trees most durable as posts and sills, and most suitable for cabinet-work—all these and many more subjects are treated in an instructive and entertaining way in this pamphlet, which will be found interesting to very many persons outside of the state of Michigan.